

## **REMARKS**

### **The Amendments**

Claims 17, 19-21, 23, 24 and 29 are amended to provide the missing formulae numbers which were inadvertently cut off in the last reply. New dependent claim 45 is added which is fully supported by the disclosure and original claims. The amendments do not narrow the scope of the claims and/or were not made for reasons related to patentability.

Applicants reserve the right to file one or more continuing and/or divisional applications directed to any subject matter disclosed in the application which has been canceled by any of the above amendments.

### **The Claim Objections**

The claim objections are addressed by the above amendments.

### **The First Rejection under 35 U.S.C. §103**

The rejection of claims 17-44 under 35 U.S.C. §103, as being obvious over WO 2001/40853 (WO '853) in view of Jacob (US Pub. No. 2002/086120) is respectfully traversed.

WO '853 discloses a zenithable bistable liquid crystal device. WO '853 is primarily directed to the construction of the cell and particularly the alignment layer to provide small surface features separately capable of providing bistable pretilts and an alignment direction and collectively causing larger variations of the molecular orientation across the layer; see, e.g., the Abstract of the reference.

WO '853 provides little disclosure or suggestion regarding the liquid crystal material for use in its devices. It appears that the only disclosures specific to the type of liquid crystal material to be used in the WO '853 devices is at page 8, lines 14-21, wherein it is disclosed that the birefringence of the materials should be "as high as possible" and typically having a  $\Delta n$  between 0.18 and 0.25, and in Example 1 (page 32) where it is disclosed to use a material with positive dielectric anisotropy but for which no actual value is given.

Thus, WO '853 gives no guidance or suggestion to one of ordinary skill in the art to select liquid crystal materials for its devices which contain materials having very high dielectric anisotropy,  $\Delta\epsilon$ , of at least 25 and some materials with  $\Delta\epsilon$  of at least 25 or materials meeting a particular formula. Compare the requirements of claims 17 and 30 and the further requirements of the dependent claims as to the liquid crystal materials used in the claimed devices/methods.

Jacob discloses liquid crystal materials for STN displays having low addressing voltages and discloses liquid crystal materials of certain formulae and mixtures thereof. Jacob provides a general discussion that liquid crystal displays use materials having a high dielectric anisotropy but typically mixed with materials of neutral dielectric anisotropy. It also discloses that for STN displays, which are the subject of its invention, dielectrically negative materials can also be employed; see, e.g., page 1, paragraphs [0006] - [0007]. Jacob further discloses that its liquid crystal media have a birefringence,  $\Delta n$ , in the range from 0.100 to 0.180

Jacob provides no suggestion that its materials are suitable or would be desired for use in the particular zenithable bistable liquid crystal devices such as those of WO '853. There is no mention in Jacob of such particular type of displays or indication that its materials would be particularly suited for such displays.

Further, the minor amount of guidance provided in WO '853 for selecting liquid crystal materials for its devices does not point one of ordinary skill in the art to use materials such as disclosed by Jacob. To the contrary, it directs away from such selection. WO '853 teaches to use materials having an optical anisotropy,  $\Delta n$ , between 0.18 and 0.25 and particularly directs that this property be "as high as possible." But the materials of Jacob are disclosed as only having, at its maximum range, an optical anisotropy,  $\Delta n$ , of 0.1 to 0.18. Although it can be said that the maximum and minimum of these ranges overlap at the single point 0.18, the fact that Jacob teaches to use materials with the highest  $\Delta n$  would direct one of ordinary skill in the art away from choosing the materials of Jacob with lower  $\Delta n$ .

Further, the fact that WO '853 discloses the use of materials with positive dielectric anisotropy and that the materials of Jacob have positive dielectric anisotropy does not suggest that the materials of Jacob are useful or desired in the WO '853 devices. Most liquid crystal materials have positive dielectric anisotropy and Jacob even discloses that all displays use media with positive

dielectric anisotropy. But there are a multitude of liquid crystal materials, other than those of Jacob, which have positive dielectric anisotropy. There is no direction from either reference that the particular materials of Jacob were suitable or desired for the particular type of display device of WO '853. Further, Jacob discloses that its materials are "highly" dielectrically positive; see, e.g. paragraphs [0020] and [0026], page 2, and WO '853 does not disclose the selection of materials which are "highly" dielectrically positive.

In view of all of the above arguments, it is urged that consideration of the teachings of the prior art, as a whole, fail to support the combination of these teachings whereby the liquid crystal materials of Jacob would be used in the zenithable bistable liquid crystal devices of WO '853. Thus, the claimed invention is not rendered obvious by the cited prior art and the rejection under 35 U.S.C. §103 should be withdrawn.

It is believed that further arguments of nonobviousness apply to dependent claims but those arguments are preserved since, in view of the above argument, they are not believed to be necessary at this time.

#### **The Second Rejection under 35 U.S.C. §103**

The rejection of claims 43-44 under 35 U.S.C. §103, as being obvious over Jacob (US Pub. No. 2002/086120) is respectfully traversed.

It is alleged that Jacob discloses liquid crystal media which contain compounds falling within formula II of the instant claims. Applicants respectfully disagree. The HP-3N.F, HP-4N.F, HP-5N.F compounds of Jacob do not fall within applicants' formula II. These compounds require an alkyl R<sup>1</sup> group (see the fifth entry for nN.F in the table on page 11 of Jacob). Compare the definition of R<sup>21</sup> in applicants' formula II. Despite that it discloses many specific compounds in its 22 mixture examples, it appears that Jacob discloses no specific compounds which have terminal alkenyl group (code V) on one side and a terminal cyano group (code N) on the other side.

While it is true that the generic formula I of Jacob would broadly encompass compounds within applicants' formula II, applicants respectfully submit that there is insufficient suggestion from Jacob to make all of the selections from the broad genus' necessary in Jacob to arrive at liquid crystal media meeting the requirements of claim 43 or 44. As pointed out above, there are no disclosures of

any particular compounds of applicants' formula II, thus, there is no direction to make such a selection within Jacob's formula I.

Further, there is no direction to select from Jacob compounds of applicants' formula I since there is no disclosure of any particular compounds falling within applicants' formula I (i.e., none of the mixtures use compounds of the generic "EPCH" formula of Jacob). In fact, other than this unspecified EPCH formula, the main text of the reference does not appear to disclose any generic formula which would encompass compounds of applicants' formula I of claim 43, i.e., EPCH with a terminal cyano group.

Finally, there is no suggestion to make the above particular selections and combine them in a composition with a compound of applicants' formula IIID or IIIE. While Jacob discloses compounds within these formulae in liquid crystal media, there is no suggestion to combine them with the compounds of applicants' formulae I or II.

For the above reasons, it is urged that there is no suggestion from Jacob to make the combinations necessary to arrive at liquid crystal media according to applicants' claims 43 or 44. Thus, the invention of these claims is not rendered obvious to one of ordinary skill in the art by Jacob and the rejection under 35 U.S.C. §103 should be withdrawn.

It is submitted that the claims are in condition for allowance. However, the Examiner is kindly invited to contact the undersigned to discuss any unresolved matters.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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